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## Specification

Method for the Production of a Printed Product, Processing Device, and System for the Production of Printed Products

The invention relates to a method for producing a printed product, a device for further processing, as well as an installation for producing printed products in accordance with the preambles of claims 1, 3 or 4.

DE 43 25 725 C2 shows a web-fed rotary printing press with a hot air dryer and cooling rollers, wherein the web is rolled up again after having been printed.

DE 198 37 117 A1 describes a method for producing newspapers, wherein webs imprinted with the editorial contents and contents of inserts are wound on assigned rolls. The rolls required for a complete newspaper are then rolled off again, combined and longitudinally folded.

The object of the invention is based on creating a method for producing a printed product, a device for further processing, as well as an installation for producing printed products.

In accordance with the invention, this object is attained by means of the characteristics of claims 1, 3 or 4.

The advantages to be attained by means of the invention consist in particular in that a very high degree of production flexibility is achieved by means of the method of the invention. For one, the method permits the 100% utilization of the production speed which can be reached by the web-fed printing press, entirely regardless of the working speed of the separating devices. Also, by means of the method of the invention it is very simple to produce

printed products which are put together from different parts, one of which can for example be produced in high numbers and which can be arbitrarily combined with at least a second part, of which different versions are produced, each at lower numbers.

A printing installation for newspaper or job printing is divided on the one hand into a web-fed printing press with an unreeling device and one or several print units for imprinting a web rolled off a roll by means of the unreeling device, and a re-reeling device for rolling up the web after its passage through the print units, and on the other hand into a separating device, wherein an unreeling device is connected directly with the inlet of a structural component. A web imprinted in the rotary printing press is supplied to the separating device in the form of a roll. Imprinting and separation become independent of each other in this way; they can take place at different times, in different locations and/or at different speeds.

Exemplary embodiments of the invention are represented in the drawings and will be explained in greater detail in what follows.

Shown are in:

Fig. 1, a schematic lateral view of a web-fed printing press in accordance with the invention,

Fig. 2, a lateral view of a separating device in accordance with the invention, and

Fig. 3, a view from above on the separating device.

The first structural component of the printing press in Fig. 1 is an unreeling device 01, here a roll changer 01, to which rolls 02 of material to be imprinted, in particular

paper rolls 02, are conveyed by means of transport carts 03, which run on rails placed under the floor of a building into which the printing press has been placed. The web 04 of material discharged from the unreeling device 01, in particular the paper web 04, initially passes through a draw-in unit 06, whose job it is to feed the web 04 to subsequent structural processing groups at a well defined tension which is identical across the width of the web 04 and remains chronologically unchanged.

These subsequent structural processing groups are first a plurality of print units 07, each of which imprints the front and back of the web 04 in a color. The schematic representation in Fig. 1 shows offset print units, however, other printing techniques can also be considered. The printing press is embodied as a newspaper printing press (i.e. several printing plates are arranged side-by-side in the axial direction of the forme cylinder, for example) or a printing press for jobbing (i.e. a single printing plate is arranged in the axial direction of the forme cylinder, for example). A total of five print units 07 for four printing colors and black are provided, not all of which are shown in the drawing figure.

After the print units 07, the paper web 04 passes through a dryer 08 for drying the ink freshly imprinted on the web 04. The paper web 04 emerging hot from the dryer 08 is being conducted through a cooling roller arrangement 09.

The dryer 08 and the cooling roller arrangement 09 are necessary in particular in those cases where it is intended to employ the printing press (inter alia) for job-printing coated paper with little absorption capability; if the

printing press is intended for newspaper printing only, wherein paper capable of absorption is generally employed, the dryer 08 can also be omitted.

The last structural component of the printing press is formed by a reeling device 11, on which the finished web 04 is again rolled up into a roll 12.

Since with this printing press there are no transverse cutting and folding devices located in the path of the paper web 04, an important limiting factor of the web running speed with which the printing press can be operated does not apply, and high production speeds can be achieved.

Every time the capacity of the reeling device 11 is exhausted or a print job has been completed, the rewound roll 12 is removed from the reeling device 11 and taken away, and several imprinted rolls 12 are generated in this way. However, in another variation it is possible to employ several printing presses for creating imprinted rolls.

The imprinted rolls 12 are further processed in the separating device represented in Figs. 2 and 3. As the first structural unit, the latter comprises at least one unreeling device 13, which can be structurally identical to the unreeling device 01 in Fig. 1. In the exemplary embodiment of Figs. 2 and 3 there are two unreeling devices 13a and 13b provided; depending on the number of pages of the printed product to be produced, larger numbers of unreeling devices 13 can be considered in a separating device.

The web running direction in the roll changers 01 of the web-fed printing press and of the roll changers 13a, 13b in the further processing device extends in parallel.

Each of these unreeling devices 13a, 13b is provided with rolls 12a, 12b of webs which had previously been imprinted in the printing press. The rolls 12a, 12b of webs simultaneously being processed in the separating device can be rolls 12 which were created at different times on the printing press in Fig. 1. This means that, differing from a customarily continuous print installation, in which webs simultaneously imprinted in different print units are brought together and are together conducted to a separating device, here (not considering re-tooling times) a conveying speed of the webs in the separating device is sufficient which is only half the size of the conveying speed in the printing press in order to separate the entire production of the latter. Looked at from a different viewpoint, the division into a printing press and processing device makes it possible to produce printing products put together from several imprinted webs without it being necessary to make print units simultaneously available for each one of these webs. It is quite obvious that a very flexible production is possible in this way with low investment costs.

Draw-in units 14a, 14b, which can be structurally identical with the draw-in unit 06 of the printing press, are arranged downstream of each of the unreeling devices 13a, 13b. The imprinted webs 16a, 16b, which are tension-regulated in the draw-in unit 14a or 14b, are conducted to a superstructure 17, at whose inlet rotating cutters 18a, 18b separate each of them into several partial webs 19a, 19b. In the example in Fig. 2 it can be seen that the web 16a is cut into two partial webs 19a, and the web 16b into three partial

webs 19b, whose width, assuming a width of the original webs 16a, 16b of four pages, could for example be 2, 2 and 2, 1, 1. For example, one page corresponds to respectively one newspaper page. A turning bar arrangement 21 is used for mixing the partial webs 19a, 19b.

The partial webs 19a, 19b mixed in the turning bar arrangement 21 are distributed onto two folders 22, 23, one of which, as can best be seen in the view from above in Fig. 3, is equipped with a former 24, which is centered on the uncut original webs 16a, 16b and extends over the entire web width, and the second folder 23 has two formers 26 of half the width of the former 24, which are respectively centered on the partial webs 19a, 19b created by the centered longitudinal cutting of the web 16a or 16b. Finally, the partial webs are combined in the folders 22, 23 by transverse cutting and transverse folding into the finished printed products and are delivered to a conveyor belt 27.

A sheet delivery device 28 is also shown in the drawing parallel with the folders 22, 23, to which a web or partial web can be supplied for cutting it transversely there and to deliver it in the form of individual sheets to a stack 29.

In general the printing press in Fig. 1 and the separating device in Figs. 2 and 3 would be placed spatially closely together in order to keep the transport paths of the imprinted rolls 12 from the reeling device 11 of the printing press to the unreeling devices 13a, 13b of the separating device short. For example, the web-fed printing press and the further processing device are arranged in a common building. However, this is not necessary. For example, it is conceivable to deliver imprinted rolls from print shops at

different locations to a central location for separation for performing the separation there. It is possible in this way to have different parts of a standardized printing order printed at different locations and to combine them into the finished printed product only at the central location of the separating device. This makes it possible for several print shops to pool their capacities for completing orders which would exceed the capacity of a single one of them, or to make use of remaining capacities by taking on partial orders and in this way to achieve a high degree of use of their machines.

It is otherwise also conceivable to flexibly produce printed products which consist, such as many daily newspapers, of a super-regional uniform portion and regionally specific portions, in that the super-regional portion is printed at a location with large editions, while the local portions are respectively printed at different locations in smaller editions, to distribute the rolls with the super-regional portion to the different locations and to combine them there with the regional portions and to make them into individual newspapers.

The configuration of the separating device represented in Figs. 2 and 3 permits the production of printed products with up to 32 pages, if two rolls 16a, 16b, each imprinted by means of a 16-page printing press, are combined and individualized. It would of course be possible to easily increase the number of unreeling devices, and therefore the number of imprinted rolls which can be simultaneously processed in order to make products with 48 or 64 pages (from three or four webs), for example.

The imprinting of the web and the separation into individual printed products become independent of each other by the invention, they can take place at different times, in different locations and/or at different speeds.

The line for further processing can be complemented, for example, by varnishing units, perforating units, retaining units, Karen adhesive systems, glue application, as well as variable rotogravure folding apparatus.



## List of Reference Symbols

01	Unreeling device, roll changer
02	Roll, roll of material, paper roll
03	Transport cart
04	Web, web of material, paper web
05	-
06	Draw-in unit
07	Print units
08	Dryer
09	Cooling roller arrangement
10	-
11	Reeling device, re-reeling device,
12	Roll (a, b), web roll
13	Unreeling device (a, b)
14	Draw-in unit (a, b)
15	-
16	Web (a, b), web of material
17	Superstructure
18	Cutter (a, b)
19	Partial webs (a, b)
20	-
21	Turning bar arrangement
22	Folder
23	Folder
24	Former
25	-
26	Former
27	Conveyor belt

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28	Sheet delivery device
29	Stack